

Posttraumatic Stress Disorder Among Hispanic Vietnam Veterans

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Objective: The purpose of this study was to examine posttraumatic stress disorder (PTSD) among Hispanics who served in the Vietnam War. **Method:** The authors conducted secondary data analyses of the National Vietnam Veterans Readjustment Study, a national epidemiologic study completed in 1988 of a representative sample of veterans who served during the Vietnam era (N=1,195). **Results:** After adjustment for premilitary and military experiences, the authors found that Hispanic, particularly Puerto Rican, Vietnam veterans had significantly more severe PTSD symptoms and a higher probability of experiencing PTSD than nonminority veterans. However, they had no greater risk for other mental disorders, and their greater risk for PTSD was not explained by acculturation. Despite their more severe symptoms, Hispanic veterans, especially Puerto Rican veterans, showed no greater functional impairment than non-Hispanic white veterans. **Conclusions:** Hispanic Vietnam veterans, especially Puerto Rican Vietnam veterans, have a higher risk for PTSD and experience more severe PTSD symptoms than non-Hispanic white Vietnam veterans, and these differences are not explained by exposure to stressors or acculturation. This high level of symptoms was not accompanied by substantial reduction in functioning, suggesting that the observed differences in symptom reporting may reflect features of expressive style rather than different levels of illness.

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The study of mental disorders among Hispanics presents numerous methodological challenges, such as the need to differentiate between subgroups of Hispanics, the need to address differences in acculturation, and the need to assess the differential effect of ethnocultural factors on symptom presentation and community functioning (1–6). Failure to attend to these challenges can result in contradictory findings across studies, both within the general population of Hispanics and among special subpopulations of Hispanics such as Vietnam veterans at risk for posttraumatic stress disorder (PTSD) (4, 7–12).

The study of PTSD among Hispanics presents a notable example of these challenges. In 1990, the National Vietnam Veterans Readjustment Study (11) sug-

gested that Hispanic veterans are at higher risk for war-related PTSD than their white and black counterparts. Helzer et al. (12), however, using data from the Epidemiologic Catchment Area (ECA) study, found no differences in PTSD or its symptoms across groups defined by age, race, ethnicity, and sex. Reporting on a clinically convenient sample of veterans with PTSD seeking services at the Department of Veterans Affairs, Rosenheck and Fontana (13) found that Puerto Rican, but not Mexican American, veterans had more severe PTSD and higher service use than other veterans.

In this study, we reexamined the National Vietnam Veterans Readjustment Study data to further understand the relationship between PTSD and Hispanic ethnicity. We sought to determine 1) whether differences in premilitary or military experiences account for observed differences in prevalence of PTSD between Hispanic veterans and other veterans, 2) whether the findings are generalized across subgroups of Hispanic veterans, 3) whether acculturation accounts for observed differences in risk for PTSD, 4) which specific dimensions of PTSD symptoms are more prevalent among each of the Hispanic subgroups, and 5) whether differences in symptoms across racial and ethnic groups are accompanied by parallel differences in functional impairment.

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METHOD

The National Vietnam Veterans Readjustment Study was conducted on a national sample of veterans who served in the U.S. armed forces during the Vietnam War. The sample was drawn from military personnel records, and the sampling frame is fully described in the original publications on the study (11, 14). Black and Hispanic veterans were oversampled to provide adequate power for subgroup analyses of the type presented here. Our current study focused on all male veterans who served in the Vietnam theater (N=1,195).

Measures

The independent variables were categorized into three sets: premilitary, military, and postwar readjustment factors.

Premilitary factors included 1) year of birth, 2) education, 3) criminal justice involvement, 4) childhood poverty or parental financial hardship, 5) antisocial traits before 15 years of age, 6) childhood physical or sexual abuse, and 7) family instability (the sum of 11 dichotomous items). Military factors included 1) age at entry into the military, 2) combat experience, 3) participation in atrocities, 4) extensive war-zone experience, and 5) adult nonmilitary trauma.

Measures of current functional status included 1) final educational attainment, 2) occupational instability, 3) marital problems, 4) subjective well-being, 5) social isolation index, and 6) the Psychiatric Epidemiology Research Interview active expression of hostility scale (15).

Two measures were used to assess PTSD outcomes. The first was the Mississippi Scale for Combat-Related Posttraumatic Stress Disorder (16), a summation scale that was constructed using 36 Likert-scaled questions on five domains (reliving, numbing, hyperarousal, guilt, and avoidance). The second measure was the predicted probability of meeting diagnostic criteria for PTSD. This measure, referred to as the National Vietnam Veterans Readjustment Study composite (11), was created by using three continuous measures of PTSD—the Minnesota Multiphasic Personality Inventory, the Impact of Event Scale (17), and the Mississippi scale. The DSM-III diagnoses obtained from the National Institute of Mental Health Diagnostic Interview Schedule (DIS) (18) were used to assess the prevalence of seven other mental disorders.

Data were also obtained on nationality and acculturation of Hispanic veterans. Questions addressed country of predominant residence, language as both a child and an adult, and preferences between English and Spanish for speech, writing, and reading. Race and ethnicity were determined on the basis of self-reports. Five dummy variables were constructed for race and ethnicity (white non-Hispanic, black non-Hispanic, Puerto Rican, Mexican American, and other Hispanic). If the respondent was Hispanic, he was asked to indicate with which subgroup he identified: Puerto Rican (N=61); Mexican American (N=176); and other (Cuban, Cuban American, and Central or South American) (N=35).

Statistical Analysis

First, we used general linear models of the predicted probability of PTSD and the PTSD severity measures to examine differences across racial and ethnic categories. Second, we evaluated the bivariate associations between premilitary and military factors and race and ethnicity. Third, regression models were used to test the association between the acculturation variables and the predicted probability of having PTSD for all Hispanic veterans and for each of the Hispanic subgroups.

Multivariate models were used to determine whether the relationships of race and ethnicity to the PTSD measures were weakened by controlling for premilitary and military factors. Finally, to determine whether groups with higher levels of PTSD symptoms experienced related impairments in functioning, these analyses were repeated with measures of functional status as the dependent variables.

RESULTS

Sample Characteristics

The subjects in the National Vietnam Veterans Readjustment Study data set have been described in detail elsewhere (11, 14). The mean year of birth of Vietnam theater veterans was 1945 (plus or minus 5 years). Of the theater veterans, 561 (47%) were non-Hispanic white, 301 (25%) were non-Hispanic black, 61 (5%) were Puerto Rican, 176 (15%) were Mexican American, 35 (3%) were other Hispanic, and 61 (5%) were of other ethnicity.

Racial and Ethnic Differences Across PTSD Measures

The mean values of the probability measure (range=0–1) are equivalent to the estimated proportions of subjects with PTSD. The groups differed significantly on the mean probability of PTSD, and the highest proportions were among Puerto Rican and Mexican American veterans (Tukey-adjusted $F=6.7$, $df=4$, 1104, $p=0.0001$): for non-Hispanic white veterans, mean=0.13 (SD=0.30); for non-Hispanic black veterans, mean=0.21 (SD=0.34); for Puerto Rican veterans, mean=0.33 (SD=0.32); for Mexican American veterans, mean=0.29 (SD=0.33); and for other Hispanic veterans, mean=0.21 (SD=0.26). They also significantly differed on the mean severity (range=36–180) of PTSD on the Mississippi scale, and the highest scores were among Puerto Rican, Mexican American, and non-Hispanic black veterans (Tukey-adjusted $F=6.0$, $df=4$, 1126, $p=0.0001$): for non-Hispanic white veterans, mean=71.2 (SD=21.8); for non-Hispanic black veterans, mean=78.5 (SD=21.3); for Puerto Rican veterans, mean=82.1 (SD=25.7); for Mexican American veterans, mean=78.1 (SD=21.5); and for other Hispanic veterans, mean=65.6 (SD=21.8).

To assess whether the relationship of trauma to PTSD was the same across the racial and ethnic subgroups, we used separate regression analyses to test if there were interactions between race and ethnicity and each of the trauma-related variables. We did not find any significant interactions when predicting either PTSD probability or severity, suggesting that the association of trauma and PTSD is not dependent on one's racial or ethnic classification.

Race and Ethnicity and Premilitary and Military Factors

Table 1 shows the measures of association between the race and ethnicity variables and premilitary and military factors. Black veterans differed from white veterans on six of 12 measures, reflecting both poorer premilitary and military adjustment. Puerto Rican veterans, in contrast, did not differ from white veterans on any of the measures. Mexican American veterans differed from white veterans on six measures, which all reflected poorer premilitary adjustment. Other Hispanic veterans did not differ from white veterans on any of the measures.

TABLE 1. Associations Between Race/Ethnicity and Selected Characteristics of Vietnam Theater Veterans^a

Dependent Variable	Black Non-Hispanic (N=301)		Puerto Rican (N=61)		Mexican American (N=176)		Other Hispanic (N=35)	
	Beta	p	Beta	p	Beta	p	Beta	p
Premilitary factors								
Year of birth	-0.08	0.01	0.03	0.24	0.09	0.003	0.05	0.11
Less than high school education or equivalent ^b	-0.01	0.87	-0.01	0.91	0.15	0.01	-0.03	0.78
Criminal justice involvement since 18	0.14	0.001	-0.03	0.31	0.11	0.001	-0.04	0.22
Childhood poverty	0.10	0.001	0.02	0.47	0.10	0.001	-0.04	0.14
Antisocial personality before 15 years	-0.01	0.73	0.00	0.91	0.07	0.02	-0.04	0.16
Childhood physical and sexual abuse	0.07	0.02	0.00	0.99	0.02	0.55	-0.04	0.15
Family instability	0.17	0.0001	0.01	0.86	0.14	0.0001	0.02	0.41
Military factors								
Age when began active service	-0.15	0.59	0.03	0.91	-0.05	0.84	-0.08	0.78
High degree of combat exposure	0.01	0.67	0.03	0.37	-0.01	0.80	-0.01	0.94
Participation in atrocities ^b	0.01	0.91	0.01	0.70	0.00	0.98	0.01	0.79
High degree of war zone experience ^b	0.06	0.04	0.04	0.17	0.04	0.16	0.01	0.93
Adult nonmilitary trauma	-0.06	0.06	-0.01	0.71	-0.03	0.36	-0.05	0.10

^a Standardized coefficients (beta); referent group is white non-Hispanic (N=561).

^b Logit, standardized estimate; binary response, presence of the condition listed versus its absence.

TABLE 2. Associations Between Race/Ethnicity and PTSD and Related Psychiatric Disorders in Vietnam Theater Veterans, Adjusted for Premilitary and Military Characteristics^a

Dependent Variable	Black Non-Hispanic (N=301)		Puerto Rican (N=61)		Mexican American (N=176)		Other Hispanic (N=35)	
	Beta	p	Beta	p	Beta	p	Beta	p
PTSD probability (according to the National Vietnam Veterans Readjustment Study)	0.00	0.89	0.10	0.0001	0.09	0.001	0.02	0.36
PTSD severity (Mississippi scale)	0.04	0.14	0.09	0.0002	0.01	0.75	-0.06	0.02
Reliving	0.03	0.29	0.10	0.0001	0.05	0.07	-0.01	0.58
Numbing	0.03	0.35	0.04	0.10	-0.06	0.04	-0.05	0.04
Hyperarousal	0.13	0.0001	0.15	0.0001	0.08	0.01	-0.02	0.50
Guilt	-0.09	0.003	0.09	0.002	0.03	0.34	-0.03	0.32
Avoidance	0.07	0.005	0.06	0.02	0.01	0.72	-0.05	0.04
Other								
Alcohol abuse or dependence ^b	-0.11	0.005	0.03	0.46	0.08	0.03	-0.02	0.61
Drug abuse or dependence ^b	-0.03	0.69	0.14	0.01	0.07	0.29	0.90	0.001
Antisocial personality disorder ^b	0.03	0.66	0.12	0.07	-0.11	0.18	-0.14	0.07
Any DIS disorder (except PTSD) ^b	-0.08	0.05	0.06	0.09	0.09	0.02	-0.02	0.67
Major depressive episode ^b	0.08	0.31	0.16	0.01	-0.02	0.82	-0.20	0.19
Panic disorder ^b	-0.22	0.11	0.09	0.26	-0.05	0.63	-1.79	0.97
Generalized anxiety disorder ^b	-0.02	0.64	0.07	0.07	-0.01	0.78	-0.03	0.47

^a Standardized coefficients (beta); referent group is white non-Hispanic (N=561). Adjusted for statistically significant ($\alpha=0.05$) independent premilitary and military variables listed in table 1 that were associated with being Puerto Rican or Mexican American.

^b Logit, standardized estimate; binary response, presence of the condition listed versus its absence.

Adjusted for Premilitary and Military Factors

After adjusting for premilitary and military risk factors for PTSD, we found that Puerto Rican and Mexican American veterans still had significantly higher probabilities of PTSD than white veterans (table 2). Puerto Rican veterans also had more severe PTSD symptoms than white veterans according to Mississippi scale scores. Black veterans did not differ from white veterans on the overall measures of PTSD but were different on three of the PTSD subcomponents, scoring lower than white veterans on the guilt subcomponent and higher on the hyperarousal and avoidance subcomponents. Puerto Rican veterans, in contrast, scored significantly higher than white veterans on four of the subcomponents (reliving, hyperarousal, guilt, and avoidance), and Mexican American veterans scored significantly higher than white veterans on the

hyperarousal component and lower on the numbing component. Other Hispanic veterans scored significantly lower than white veterans on the numbing and avoidance components.

For other psychiatric disorders, black veterans differed from white veterans on two of the seven measures, having lower odds for alcohol abuse or dependence and any DIS disorder other than PTSD. Puerto Rican and Mexican American veterans also differed from white veterans on two of these diagnostic measures. Puerto Rican veterans had higher odds for drug abuse or dependence and major depressive episode. Mexican American veterans had higher odds for alcohol abuse or dependence and any DIS disorder except PTSD. Other Hispanic veterans differed from white veterans on one measure; they had higher odds of drug abuse or dependence (table 2).

TABLE 3. Associations Between Race/Ethnicity and Current Functional Status of Vietnam Theater Veterans, Adjusted for Premilitary Family Instability^a

Dependent Variable	Black Non-Hispanic (N=301)		Puerto Rican (N=61)		Mexican American (N=176)		Other Hispanic (N=35)	
	Beta	p	Beta	p	Beta	p	Beta	p
Educational attainment relative to premilitary education	-0.02	0.58	-0.03	0.35	-0.06	0.04	-0.02	0.36
Occupational instability	-0.08	0.01	0.03	0.27	-0.03	0.39	-0.02	0.49
Marital problems	0.08	0.02	0.05	0.14	0.06	0.08	0.02	0.62
Subjective well-being	-0.07	0.02	-0.01	0.82	-0.06	0.04	0.02	0.44
Social isolation	-0.01	0.81	0.06	0.06	0.03	0.37	-0.03	0.30
Psychiatric Epidemiology Research Interview active expression of hostility scale	-0.06	0.04	-0.02	0.61	0.00	0.90	-0.02	0.43

^a Standardized coefficients (beta). Referent group is white non-Hispanic (N=561).

Nationality and Acculturation

Examination of the relationships between nationality and acculturation and PTSD probability in the entire sample of Hispanic veterans revealed no statistically significant associations at $p=0.05$. Parallel analyses were conducted for each of the Hispanic subgroups, and, again, no significant associations were found. Further, a significant association was not found between the composite acculturation variable, treated as an ordinal scale, and PTSD probability. Nor was any significant relationship found between each of the three categorized groups of acculturation (not acculturated, bicultural, and acculturated) and the probability of having PTSD.

Current Functional Status

The pattern of findings for functional impairment (table 3) was quite different from that observed for PTSD. Black veterans had less occupational instability and expression of hostility but more marital problems and poorer subjective well-being than white veterans. Puerto Rican veterans, who had the most severe PTSD symptoms by far, were not significantly different on any measure of functional outcome. Mexican American veterans had poorer functional impairment on two of the six measures, and they scored worse than white veterans on the hyperarousal domain of PTSD severity. No significant associations were found for other Hispanic veterans (table 3).

DISCUSSION

In agreement with previous reports from the National Vietnam Veterans Readjustment Study, this study documented that Hispanic Vietnam veterans have a higher probability of having PTSD than white and black veterans and that they have more severe symptoms in multiple domains, even after we controlled for premilitary and military factors. This study went beyond the original National Vietnam Veterans Readjustment Study report (14) by examining PTSD among specific Hispanic subgroups and examining differences between subgroups on clinical subcomponents of the PTSD syndrome. Both Puerto Rican and

Mexican American veterans demonstrated a significantly higher probability of having PTSD than white veterans, but the remaining Hispanic veterans did not. Puerto Rican veterans, in particular, reported a higher probability of PTSD and more severe symptoms than the other groups, specifically on the reliving and hyperarousal components.

Unlike other studies of mental health disorders among Hispanics, in which acculturation has been shown to be associated with higher rates of mental illness (4), data presented here show no association between acculturation and PTSD. We suggest two potential explanations for these findings. First, Hispanics who entered the military may have been more acculturated to begin with than Hispanics who did not enter the military. In a separate set of analyses, we found that Puerto Rican, Mexican American, and other Hispanic veterans had significantly higher mean levels of total education than matched civilians. Second, because of its unique etiology in war trauma, PTSD may be less affected by acculturation than other mental illnesses.

The observation that Puerto Rican veterans had consistently more reliving and hyperarousal symptoms is consistent with other studies that have reported 1) that among mainland Puerto Ricans, reporting psychological symptoms is relatively acceptable and possibly desirable (19), 2) that Puerto Ricans, particularly those who are less acculturated, are more expressive in their responses to mental health questions, which may reflect an acquiescent response style (20–22), and 3) that somatization is a socially common way of expressing psychological distress among Puerto Ricans (3, 23, 24). Dohrenwend and Dohrenwend (20) found that Puerto Ricans had more psychiatric illness than other groups with comparable sociodemographic characteristics and that there is a distinctive willingness among Puerto Ricans to express symptoms of mental illness, suggesting that the responses may be culturally conditioned.

Examination of data on current functional status suggested that these differences in symptom presentation were not paralleled by evidence of functional impairment. Although Hispanic, particularly Puerto Rican, Vietnam veterans had more symptoms than non-Hispanic white veterans, they showed no consis-

tent evidence of greater loss of functional capacity. This discrepancy suggests that although Hispanic Vietnam veterans are more likely than white veterans to have PTSD symptoms, these symptoms do not, on average, result in greater functional impairment. It appears that the high rates of PTSD among Hispanics who served in the Vietnam War, and especially among Puerto Rican veterans, may be more a reflection of culturally based expressive style than of disabling psychopathology.

Several limitations of this study should be addressed. First, the study design is cross-sectional; therefore, assessments are retrospective. As a result, there may be some recall bias regarding war trauma and experiences. Second, the race and ethnicity variables are relatively simple measures that do not address particulars of personal identity or ethnocultural background. Third, because this is a study of veterans who served in a war zone, the observations may be limited to those who served in Vietnam. However, a parallel set of analyses showed the same ethnocultural trend in veterans who served in the Vietnam era but were not sent to Vietnam. Finally, the measure of the predicted probability of PTSD is a derived measure and not based on the administration of the Structured Clinical Interview for DSM-III to all subjects.

CONCLUSIONS

This study found that neither premilitary experiences, military experiences, nor acculturation account for the greater risk for PTSD among both Puerto Ricans and Mexican Americans who served during the Vietnam War. Despite their more severe symptoms, however, Puerto Rican veterans in particular showed consistently less functional impairment than non-Hispanic white veterans, suggesting that the observed differences in symptom reporting may reflect features of expressive style rather than different levels of disabling illness. These differences may be the result of cultural factors not measured in the National Vietnam Veterans Readjustment Study. Further studies are needed to identify specific experiences, values, or beliefs that may explain these observations.

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